

Non technical Abstract

The goal of this protocol is to provide a gene therapy method for the sustained delivery of erythropoietin to treat the anemia of patients with endstage renal disease. The anemia associated with endstage renal disease is correctable by administration of recombinant erythropoietin (EPO), a hormone normally synthesized in the kidney that regulates red cell production. The availability of EPO has reduced the need for transfusions and increased the quality of life for dialysis patients. Currently EPO is delivered intravenously or subcutaneously to all ESRD patients in the US at a total cost of over one billion dollars. We have developed a method for sustained delivery of EPO via smooth muscle cells that are retrovirally transduced with the EPO gene. The EPO expressing smooth muscle cells are seeded into polytetrafluoroethylene (PTFE) vascular grafts which, when ligated into the vascular system of a patient, provide a continuous source of EPO to the circulation. The method of EPO delivery we propose will involve no extra surgery for study patients other than that currently required to create their dialysis access grafts. PTFE vascular grafts are the standard grafts used for hemodialysis access in patients with endstage renal disease. Potential benefits of this method for EPO delivery include reduced cost for EPO therapy and hematocrits higher than the limit placed by medicare reimbursement.